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New Hampshire Code of Administrative Rules
Env-Ws 372

PART Env-Ws 372 DESIGN STANDARDS FOR SMALL PUBLIC WATER SYSTEMS

Env-Ws 372.01 Purpose; Authority.

(a) RSA 485:8, provides that all proposals to establish or expand a public water supply system shall be submitted to the division for review and approval before construction.

(b) The primary purpose of these rules shall be to specify design criteria for new systems.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.02 Applicability.

(a) For the purposes of these criteria, a small public water system shall be one serving a population of 25 - 1,000 persons without street hydrant fire protection. For systems with street hydrant fire protection the appropriate rules shall be those in Env-Ws 370, Env-Ws 373, and Env-Ws 376 through Env-Ws 378.

(b) These rules shall establish acceptable design criteria for the 3 types of small public water systems: community, non-transient non-community, and transient non-community systems noted below.

(c) Criteria that only apply to a particular category of system shall be as noted in each specific rule requirement.

(d) These 3 types of public water systems shall be as follows:

(1) A community system, as defined in Env-Ws 302, shall be one serving a continuous residential population. For purposes of these criteria, vacation home developments and conversions from transient use occupancy to residential condominiums shall be considered equivalent to community public water supplies;

(2) A non-transient non-community system, as defined in Env-Ws 302, shall be one serving a population that regularly uses the system such as those at schools, workplaces, and day cares; and

(3) A transient non-community system as defined in Env-Ws 302 shall be one serving a transient population such as restaurants, motels, and campgrounds.

(e) Existing systems that are operating effectively may apply for a waiver of particular criteria. Waivers shall not be granted for criteria which poses a direct risk to health such as proper well construction, water quality standards or tank closure. Waivers shall be granted where the system can document effective operation in its current configuration.

(f) All new public water supply design approvals shall lapse 4 years after issuance, if system construction has not been started. Systems that have begun construction, but not started operation on the 4th anniversary of the approval date, shall meet all then current design criteria prior to startup. Existing approved design prior to July 1, 1992 which have not been constructed shall lapse January 1, 1998.

(g) A new design review fee and appropriate design revision shall be required for reapproval of lapsed designs.

(h) A new full water quality test shall be required for each source for the appropriate factors listed in Env-Ws 310 through Env-Ws 319.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.03 Public Water System Capacity Assurance. A community water system and nontransient noncommunity public water system shall meet the requirements of Env-Ws 371 before such system obtains design approval.

Source. #7105, eff 9-23-99

Env-Ws 372.04 Concept Approval For a Small Water System.

(a) No well drilling nor final system design shall commence on a proposed public water system until a concept approval is issued by the division.

(b) The issuance of concept approval for a proposed independent public water system shall be based on the factors as stated below:

(1) The absence of water service from another approved and capable water system. Such availability shall be determined based on the willingness of the potential extender to offer service and a comparison of the overall extension cost versus the overall cost of creation of an independent system;

(2) The method and adequacy of operation of the proposed public water system;

(3) The consistency of the proposed system with state, regional or local water resource/water supply management plans for the area;

(4) The consistency of the proposed system ownership and operation with other public utility commission franchises in the area; and

(5) Use of the best source feasibly available.

(c) "Feasible" means a comparison of water supply type alternatives based on cost. Such a comparison shall include capital and operational costs to provide an equivalent level of water supply service of both domestic and fire flow which shall provide a safe and reliable supply by an entity having adequate financial and managerial capability.

(d) Favorable criteria for the best source concept shall include:

(1) Larger public water systems;

(2) Systems which have full time employees who have higher levels of training and experience in the water works profession;

(3) Systems with high elevation bulk storage; and

(4) Systems which have an abundance of equipment, controls and communications that better ensure the reliability of operations and water quality.

(e) The concept approval review shall be based on a brief letter submitted by the applicant identifying the size and nature of the proposed public water system and a map specifically locating the proposed service area. For community systems the submittal shall also include the preliminary report required in Env-Ws 378.

(f) The design review fee shall be paid in conjunction with the final design review submittal specified in Env-Ws 372.05 and Env-Ws 372.06.

(g) The division shall not approve a community public water system design until the public utilities commission has provided comment concerning whether the system is subject to commission jurisdiction.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.05 Preliminary and Final Well Site Selection Report.

(a) Proposed new supply sources for community water systems to which this chapter applies shall also meet the requirements specified in Env-Ws 378, namely the well siting rules for community water systems. A preliminary well site selection report shall be submitted as specified in Env-Ws 378 at the same time as the concept approval submittal. The final well site selection report specified in Env-Ws 378 shall be submitted with the final water system design review plans.

(b) Proposed non-transient non-community and transient non-community systems to which this chapter applies shall not be required to submit either the preliminary or final well site selection reports or be subject to Env-Ws 378.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.06 Final Design Review Checklist.

(a) A limited submission shall be required for transient non-community and non-transient non-community systems.

(b) The submittal items shall be those below:

(1) Transmittal or identifying letter (one copy) including owner's name, address and telephone;

(2) Site plan to include the protective radius (one copy);

(3) Well detail plan with a section through well (one copy);

(4) Copy of appropriate water quality analysis (one copy); and

(5) Pumping test log if required (one copy).

(c) A complete, detailed submittal shall be required for all community water systems which includes the following items:

(1) Transmittal or identifying letter (one copy) including owner's name, address and telephone;

(2) Site plan of the entire project including the protective radius (one copy);

(3) Well detail plan with a section through the well (one copy);

(4) Pump house and control building plan and section (one copy);

(5) Specifications (one copy);

(6) Copy of appropriate water quality analysis (one copy);

(7) Performance curves of pumps (one copy/pump);

(8) Final well site selection report as required by Env-Ws 378 (one copy);

(9) Identification of certified operator (one copy); and

(10) Miscellaneous requirements where applicable including:

a. Easements, if required (one copy); and

b. Engineering report, if necessary (one copy).

(d) The plans for all systems intended to serve more than 20,000 gpd or 50 or more service connections shall be stamped by a professional civil or sanitary engineer licensed in the State of New Hampshire.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.07 Design Review Fee.

(a) A fee shall be collected for the review of all new public water systems or existing public water systems where conversion from transient use to residential-type use is proposed.

(b) The fee shall be determined as follows:

(1) For residential-type units, the fee shall be as stated in RSA 485:8, III per unit, regardless of the residential unit size;

(2) For new non-residential units, the fee shall be determined by conversion of the water system design flow to a residential-equivalent unit basis. For purposes of this rule, a "residential-equivalent unit" means an average daily demand of 300 gallons per day.

(3) The design flow for non-residential units shall be as defined by Env-Ws 372.09 or Env-Ws 1008.

(4) The fee for each residential-equivalent unit shall be as stated in RSA 485:8, III. The calculated fee for non-residential systems shall be determined by rounding off to the nearest full residential-equivalent unit.

(5) In determining the number of units the system is designed to accommodate, the division shall utilize system design parameters, proposed plans for additional construction, and other factors bearing on the ultimate system demand;

(6) The division shall presume that any application for expansion within 2 years of the initial submittal shall be part of the initial water system unless the developer demonstrates that expansions within 2 years should not be considered as part of the initial submittal;

(7) The payment shall be received at the time of the final design review submission. The amount of the fee shall be based on the number of residential-type or residential-equivalent units proposed to be served by the new public water system and approved by the division;

(8) If the design flow of a non-residential public water system is less than one-half of a residential equivalent unit, the fee shall be zero dollars;

(9) The maximum fee shall be based on 175 units or equivalent residential units; and

(10) No additional fee shall be charged for revised submissions which do not include additional units, or for submissions requesting an extension or expansion of an existing public water system.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.08 Plans.

(a) It is the intent of the submission and approval process that the design documents provide adequate information to analyze the expected system performance and to serve as a detailed permanent record for future owners, maintenance personnel and the division staff.

(b) All plans to be submitted shall be prints of original drawings. Felt tip pen highlighting on the print shall be permitted only insofar as existing line work is traced. Original linework work on prints shall not be accepted.

(c) All pages shall have the project name, project location, and date shown on each sheet. These plans and other documents shall be neat, fully detailed and drawn to scale. All lettering shall be neatly printed or mechanically or electronically set.

(d) The project plan(s) shall be carefully drawn and shall include the following items:

(1) The location key plan, which shall show the following:

a. Size: not less than 3" x 3";

b. Scale: equal to latest U.S.G.S. 1" = 2,000', if available; and

c. Identification: label streets and other principal features.

(2) The plan title block, which shall show the following:

a. Name of project, scale;

b. Name, address and phone number of owner and design date; and

c. Name of designer and phone number, provide space for dating subsequent revisions.

(3) The site plan, which:

a. Shall be drawn to scale 1" = 200'; and

1. The site plan may be drawn to any scale.

b. Shall show or identify the following:

1. Property boundaries, name of adjacent owners, and ultimate scope of project;

2. Describe the type of housing and type of occupancy, seasonal/year-round;

3. All roads, existing and proposed wastewater disposal, green areas, north arrow, lot numbers and lines;

4. The distribution system including piping size and location, pipe material, gate valves and blow-offs. Include trench section showing depth of cover, and bedding

material. A distribution plan shall not be required for non-transient non-community and transient non-community systems; and

5. Elevation contours at not less than five foot intervals.

(4) A locus map, which shall identify the following:

a. For non-community well(s), show all potential and documented sources of groundwater contamination within 4000 feet of the well site(s) and contained in the groundwater hazard inventory.

b. For community well(s), show potential contamination of sources in accordance with Env-Ws 378.

(5) The well detail plan, which for all systems shall show the following:

a. Locate proposed water supply source(s) with at least 2 measured dimensions to fixed and visible points. Draw appropriate protective radius for each source;

b. Show type and depth of well, and size and length of casing;

c. Show static water level and maximum drawdown at tested pumping rate. These levels shall be only required to be shown for community water systems; and

d. Show elevation at which pump will be installed. This level shall be only required to be shown for community water systems.

(6) The pump house and control building plan for community systems, which shall show the following:

a. Show at least one detailed scaled plan and one section of the proposed control building;

b. Show building dimensions, finished site grading, and vandal proof access door and lock;

c. Label all construction materials for floor, walls, roof, stairs; and

d. Show all piping, such as size and material, valves such as check, gate, pressure reducing, water meter, sampling tap, air compressor, storage tanks, booster pumps, heat, light, ventilation, gravity floor drain; and

(7) Controls such as: off, on, and low water level alarm.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.09 Specifications.

(a) The specifications accompanying construction drawings shall include, but not be limited to;

(1) All construction information not shown on the drawings necessary to inform the builder of the design requirements as to the quality of materials, workmanship and fabrication of the project and the type, size, strength, operating characteristics and rating of equipment;

(2) The requirements for all mechanical and electrical equipment, including valves, piping, and jointing of pipe;

(3) Electrical apparatus, wiring, meters, construction materials, and miscellaneous appurtenances; and

(4) Instructions for testing materials and equipment as necessary to meet design standards, and operating tests for the completed works and component units.

(b) The specifications shall include specific references to the following national standards:

(1) The appropriate american water works association (AWWA) manufacturing standards with respect to piping, valving and related appurtenances;

(2) The appropriate AWWA standards for construction of the water system;

(3) AWWA standards for disinfecting water mains, AWWA C651-86; and

(4) AWWA standard for hydrostatic testing of water mains AWWA C600, Section 4 or equivalent.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.10 Design Flow.

(a) Anticipated design flow for the water system shall be based on the type of use and as determined in Table 372-1.

Table 372-1
Anticipated Demand

Type of Use	Design Flow
Singly family homes (typically 3 bedrooms)	150 gallons per day per bedroom (i.e. 450 gpd)
Recreational vacation home (typically 3 bedrooms)	150 gallons per day per bedroom (i.e. 450 gpd)
Mobile homes (typically 2 bedrooms)	150 gallons per day per bedroom (i.e. 300 gpd)
Apartment/Condominium	150 gallons per day per bedroom
Efficiency Apartment	225 gallons per day per unit
Campground (sewered)	90 gallons per day per site
Campground with central comfort station	75 gallons per day per site
Motel (typically 4 persons/per room)	50 gallons per day per person
School with gym and cafeteria	25 gallons per day per student
Factory (sanitary use only)	20 gallons per day per worker
Restaurant	40 gallons per day per seat
Lounge	20 gallons per day per seat
Office space	15 gallons per person or 15 gpd/100 sq. ft.

(b) If the specific type of use is not listed above or in Env-Ws 1008, the division shall be contacted to determine appropriate design flow on a case by case basis.

(c) Where a new system is being designed, the design flow shall be those given in Table 372-1 or Env-Ws 1008.

(d) For existing public water systems that are be expanded or upgraded, the design flow may be derived by using metered water readings in accordance with one of the following:

(1) By finding the daily average of water meter readings and multiplying the average by a minimum factor of 2 or a maximum factor of 3 depending on the type or frequency of the meter readings; or

(2) By measuring 12 months of consecutive daily metering readings, in which case, the system maybe designed based on the highest daily flow and shall not require application of a multiplying factor.

(e) The developer shall specify the type of landscaping planned for the project. Where the nature of the development will require extra water supply capacity for lawn watering, swimming pools, gardens, livestock, fire hydrants or sprinklers and other unusually high water demand situations, additional supply capacity shall be provided.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.11 Acceptable Sources of Water Supply.

(a) The use of surface water shall not be allowed for any public water system governed by these rules.

(b) For a community system where the number of services exceeds 30, a minimum of 2 wells shall be required.

(c) If connection to a municipal system is proposed, a letter of verification from the supplying system shall be submitted.

(d) This letter shall state that:

(1) Adequate quantities of water are available to serve the new system; and

(2) With the new system on line, adequate system pressures will be maintained.

(e) Design criteria for municipal piping extensions shall be those in Env-Ws 376.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.12 Required Source Capacity.

(a) The required minimum total source capacity for community systems shall be not less than 2 times the design flow for the system based on a 24-hour day. A total source capacity of 1-1/2 times the average daily demand shall be acceptable for systems that have an alternate non-potable water supply for such uses as watering lawns, watering gardens, and filling swimming pools or where deed covenants restrict exterior water use. For all systems the required minimum total permitted production volume shall not be less than the design flow for the system.

(b) A minimum total source capacity of 1-1/2 times the design flow shall be required for non-community systems.

(c) For those community systems required to have two or more wells, the minimum total permitted production volume with the largest source out of service shall be equal to or greater than 50% of the system's design flow.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.13 Well Location.

(a) Non-community well(s) shall be located at least 50 feet from surface waters and natural drainage ways, and the wellhead shall be above the 100-year flood level. Where wells must be located within a flood way, the area immediately surrounding the well and pump station shall be built up above the 100-year flood elevation.

(b) Non-community wells shall be kept at least 50 feet from the edge of road right-of-ways to minimize contamination from de-icing salts.

(c) Well siting for community sources shall be as specified in section Env-Ws 378.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.14 Sanitary Protective Area and Permitted Production Volume for Groundwater Sources.

(a) To protect the long-term quality of each public water supply system, a sanitary protective area shall be established around each groundwater source and a permitted production volume shall be assigned to the source based on the size of the sanitary protective area established. The sanitary protective area shall be a circle with a specified radius, centered on the well.

(b) The sanitary protective area for community systems shall be in accordance with Env-Ws 378.

(c) The permitted production volume shall not be greater than the source capacity based on a 24 hour period defined by the pumping test or the driller's report in accordance with Env-Ws 372.14.

(d) The permitted production volume shall be based on the sanitary protective area established by the system as shown in Table 372-2 below.

Table 372-2
Sanitary Protective Area

Permitted Production Volume (gpd)	Sanitary Protective Radius Length (ft.)
0-750	75
751 - 1440	100
1441 - 4320	125
4321 - 14,400	150
14,401 - 28,800	175
28,801 - 57,600	200
57,601 - 86,400	250
86,401 - 115,200	300
115,201 - 144,000	350
greater than 144,001	400

(e) When more than one well is inside a sanitary protective area then the individual sanitary protective areas for these wells shall be based on the combined permitted production volume unless it is proven these wells are not interconnected.

(f) Land use within the sanitary protective area for community systems shall be in accordance with Env-Ws 378.

(g) The following land uses shall be specifically excluded from within the sanitary protective area of non-community systems:

(1) Wastewater disposal systems, including septic tanks and leachfields;

(2) Soil fertilization;

(3) Storage of oil, gasoline, or other hazardous chemicals; and

(4) Other uses associated with hazardous materials as determined by the division staff.

(h) Acceptable uses of the sanitary protective area for non-community systems shall include those uses listed below:

(1) Roadways;

(2) Parking lots;

(3) Tennis courts;

(4) Surface water such as lakes, rivers, and streams;

(5) Permanently protected land;

(6) Where connecting wastewater piping must pass within the sanitary protective area, the piping type shall be ductile iron or approved equal pressure-type pipe with mechanical joints, and shall be tested for water-tight construction after installation;

(7) Pumphouse and permanent buildings; and

(8) The system owner may propose other compatible uses for the sanitary radius to the division by submitting a brief evaluation which discusses:

a. The types of contaminants associated with the activity;

b. The volume of contaminant;

c. Contaminant mitigation plan; and

d. An assessment of overall risk of groundwater contamination.

(i) For non-community systems, control of the sanitary protective area shall be with the water system owner. The water system owner shall, where possible, locate the well and sanitary protective area entirely on the property owned by the water system. Once established the protective radius area shall not be subdivided. Where the sanitary protective area can not be located fully on the property owned by the water systems, written legal easements from abuttors shall be obtained. Such easements shall specifically exclude the uses described in paragraph (e) of this section from the area within the sanitary protective area.

(j) Waiver requests for non-community systems may be submitted by the system owner.

(k) They shall include:

(1) Technically important factors for a waiver of the area shall include historical water quality, if applicable, overburdened soil depth, soil type, height and consistency of water table, and direction of slope. Cost of compliance shall not necessarily be sufficient justification for a waiver.

(2) All requests for waivers shall be submitted in writing and shall be signed by the owner and engineer.

(l) Waiver requests for community systems shall be in accordance with Env-Ws 378.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.15 Pumping Tests.

(a) For all non-community systems serving 5,000 gpd or greater adequate source capacity shall be proven by a sustained 48 hour pumping test at a constant rate before final plans can be approved. The pumping test shall demonstrate stabilized drawdown for at least the last 12 hours of the test. Stabilization is defined as a drawdown of less than one inch in two hours. If stabilization is not achieved the test shall continue and the division shall be contacted.

(b) Data documenting the pump test shall be submitted on a pumping log and shall include those factors in Table 372-3.

Table 372-3
Data Submission Requirements for Pump Tests

Factor	Units
Well Depth	Feet
Time and date of pump test	
Pumping rate	gpm
Static Level (no Pumpage)	feet below top of casing
Drawdown level during pumping	feet below top of casing
Graph showing drawdown vs. time curve (to scale)	

(c) Each log sheet shall be identified by project name, town location, and submittal date.

(d) Readings for water level and pumping rate shall be taken at least every hour so long as the change in drawdown exceeds 2 feet/hour. Thereafter, readings may be taken at appropriate intervals not to exceed 4 hours. Readings shall be direct measurements and not inferred from pump curves or other inferential methods.

(e) Where wells are within 150 feet of each other, the pumping tests shall be run simultaneously.

(f) For non-community systems serving less than 5,000 gpd, the division shall not require the 48 hour pump test. However, signed statement of the well's projected safe yield shall be required from the well driller.

(g) Pumping tests for community systems shall be performed in accordance with Env-Ws 378.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.16 Water Supply Quality.

(a) A water sample shall be taken prior to the end of the pumping test from each source and analyzed for quality by the laboratory services unit of DES in Concord, or other laboratory certified for Safe Drinking Water Act (SDWA) testing. Results from unapproved laboratories shall not be accepted. For non-transient non-community and transient non-community systems samples shall be taken near the completion of the pump test. Community systems shall also take samples in accordance with Env-Ws 378. Dip samples from wells that have not been pumped for a sustained period shall not be acceptable.

(b) Special containers and sampling techniques shall be required for those sources which will supply community and non-transient non-community systems as specified in Env-Ws 320 through Env-Ws 329.

(c) Water quality shall meet the appropriate standards established in parts Env-Ws 310 through Env-Ws 319 or shall be capable of meeting these standards with approved treatment. The analysis shall have been performed within the previous 6 months.

(d) Transient non-community systems shall sample for the following factors in Table 372-4.

Table 372-4
Required Water Quality Tests for Transient Non-community Systems

Bacteria	iron
nitrate	manganese
chloride	pH
fluoride	hardness
sodium	

(e) Results of laboratory analyses shall be submitted as originals or photostatic copies of the original laboratory report. Retyping, or rewriting the data shall not be acceptable.

(f) A water system, owned by a municipality, that chooses not to fund such testing beyond bacteria, nitrate and nitrite shall not be required to do so.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.17 System Concept.

(a) For any particular project there is likely more than one approvable water system design concept. These rules shall not be interpreted to specify a particular design concept, but to ensure water system adequacy and reliability. Factors which shall govern the design criteria of the three most common concepts used for small community systems are listed below. Modification of these concepts identified in (b) below by the system designer shall be allowed where the modification can be justified.

(b) The 3 concept types and the defining criteria shall include:

(1) A hydropneumatic storage only type of system, such as straight pressure, shall require multiple high capacity wells or source pumps.

(2) An accumulation and hydropneumatic storage type of system shall require one or more wells with low or intermediate yields, which discharge into a relatively high capacity

atmospheric tank. Water from this tank is then re-pumped into the hydropneumatic tank for direct feed into the distribution system by high capacity pumps rated at peak flow.

(3) A gravity storage type of system shall require accumulation storage at high elevation. A minimum pressure of 20 psi during peak flow shall be required at the highest service connection on the system. This pressure shall require that the highest service connection be at least 46 feet lower, measured vertically, than the bottom of the storage tank. Additional separation shall be required to compensate for friction and tank drawdown.

(c) Where limited fire protection service is to be provided, the following design criteria shall be observed:

(1) Where a fire hydrant is planned at the pump station by the owner, a separate water storage tank shall be installed. The hydrant shall connect to only this tank. The refill pipe for this tank shall incorporate an air gap. There shall be no connection between the domestic water system and the fire storage tanks.

(2) Where sprinklers are planned to be installed within the service customer's premise, the service line and domestic plumbing shall be appropriately increased in size. Unless otherwise specified by local, state or national codes, the service line shall be sized to accommodate a design flow rate specified in National Fire Protection Association standards NFPA 13-D and 13-R. The sprinkler portion of the piping shall be separated from the domestic plumbing by at least a testable double check valve. The minimum duration of sprinkler flow shall be assumed to be 10 minutes.

(d) Additional provisions for source and storage facilities, in the system's design shall be made to accommodate fire flows.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.18 Sizing of Storage Tanks.

(a) The following criteria shall apply to community water systems and to those non-transient non-community systems whose reliability is directly important to the public health such as schools that are used as emergency shelters, dormitories, and rehabilitation homes. For factories, businesses, restaurants, motels, and other systems whose continued operation is not a public necessity, specific storage criteria shall not be specified.

(b) The required atmospheric, vented, storage capacity with one well shall be dependent upon, the safe yield of the wells and the system concept as specified in Table 372-5.

Table 372-5
Requirement for Atmospheric Storage Volume
For Systems That Have Only One Source

Ground Water Source Capacity	Atmospheric storage required (percent of design flow)
Peak hourly demand	50 percent
2.5 times the design flow	75 percent
1.5 times* the design flow	100 percent
Less than 1.5 times* the design flow	Not acceptable

*See Section Env-Ws 372.11

(c) The atmospheric storage vented water storage capacity with more than one well shall be as stated in Table 372-6 below:

Table 372-6
Requirement for Atmospheric Storage Volume
For Systems That Have More Than One Source

Minimum groundwater source capacity with largest producing well out-of-service	Atmospheric storage required (percent of design flow)
Peak hourly demand	none required
2.5 times the design flow	25 percent
1.5 times the design flow	50 percent
Design flow	75 percent
Less than design flow	100 percent

(d) The required hydropneumatic storage capacity shall be as specified in Table 372-7.

Table 372-7
Requirement for Hydropneumatic Storage Volume

Type of Use	Required Storage
Apartments, condominiums	45 gallons per site
Singly family housing development	45 gallons per site
Mobile home park	30 gallons per site
School	5 gallons per person

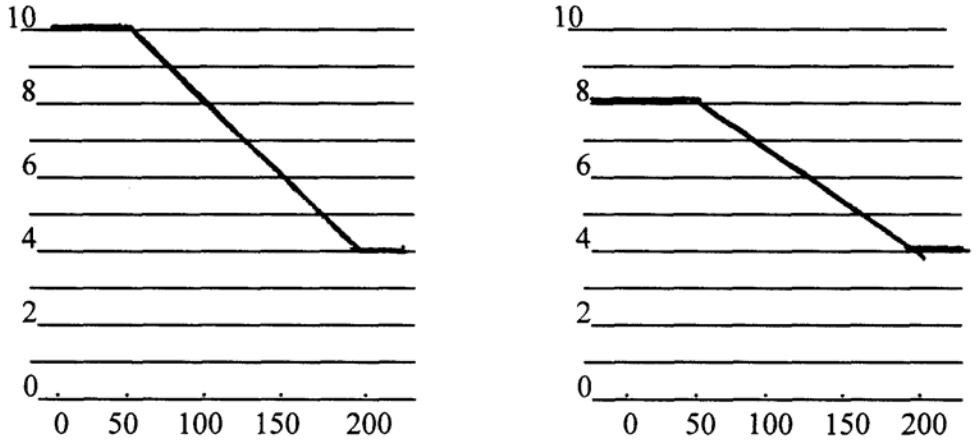
(e) Pre-charged hydropneumatic tanks shall be accepted on an equivalent gross volume basis to conventional hydropneumatic storage. No more than 6 tanks of the pre-charged type shall be permitted.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.19 Peak Flow.

(a) The relationship between peak flow, hourly demand, and design flow shall be defined by the following Table 372-9 for residential type developments and schools:

Table 372- 9
Peak Flow Charts



(b) If the specific type of use is not listed above, the division shall be contacted to determine the peak flow factor.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.20 Sizing and Installing Booster Pumps.

(a) "Booster pumps" mean those pumps that withdraw water from atmospheric storage tanks and pump to hydropneumatic tanks.

(b) Total booster capacity shall be at least equal to peak demand where booster pumps exist. Booster pumps in community public water systems and those non-transient, non-community systems directly important to public health as specified in Env-Ws 372.17(a) shall be in duplicate.

(c) Booster pumps shall be connected to a flat, secure surface of sufficient strength to withstand vibration, thrust and weight. The installed elevation of the pump base shall be at least 8" above the floor.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.21 Design and Construction of Pump Station Facilities.

(a) All public water systems shall have gravity floor drains or equivalent with all floors pitched toward the drains. Sump pumps shall not be acceptable. The floor level shall be above the seasonal high water table.

(b) The layout of equipment and the design of the pump station and control building at all public water systems shall allow convenient operation and preventative maintenance. The design and materials shall make provisions to minimize vandalism damage to wells, doors and roofs. Windows shall be avoided. The pump station walls and ceilings shall be fully insulated. Building construction material shall be highly resistant to moisture decay and vandalism.

(c) For all new pump stations, the applicant shall make every reasonable effort to design and construct the pump station to be at grade for all public systems. Where constraints are encountered, the station may be as much as 5 feet below grade. Where the floor is below grade, the access stairway shall have a slope of not more than 7:9 and a hand railing on one side. If the floor of the pump station is below grade, the design shall address the "confined space rules" of the Department of Labor, Occupational and Health Administration (OSHA) as specified in 29 CFR 1910.146.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97)

Env-Ws 372.22 Pumps And Auxiliary Equipment.

(a) For community systems and those non-transient non-community systems important to public health as specified in Env-Ws 372.17(a) that provide water to over 25 services or 50 students per day, in addition to the general control system, an alarm system shall be provided to note failure of pumps and low tank levels. Each alarm function shall be labeled and the alarm shall be equipped with a silencing mechanism.

(b) In instances where the pump house is not easily seen, the alarm system shall be of an auto dialer for telephone, radio, or audio signal to insure that the alarmed condition is communicated to nearby occupied residences or other locations acceptable to the division where action can be initiated.

(c) All community and non-transient non-community systems important to public health as specified in Env-Ws 372.17(a) shall install a water meter on each incoming source line before the water enters the storage tank(s).

(d) For all systems, a pressure gauge shall be provided. Gauges shall be installed with gauge cocks for isolation and of suitable range for the pressure to be encounted.

(e) The system shall be capable of receiving an immediate addition of a disinfectant.

(f) Components of the system required by (e) above shall include:

(1) An injection tap on source water feed lines, before all water storage tanks; and

(2) An electrical outlet interconnected with the source pump electrical system.

(g) For all systems, the pump controls shall have a manual "off/on" switch to control pump operations.

(h) Where an air compressor is provided, for air which will be in contact with drinking water, the compressor shall be of the oil-less type.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.23 Well Appurtenances and Pump Installation.

(a) All new wells shall be placed outside the pump station.

(b) Well casings shall project at least one foot above finished grade.

(c) For existing bedrock wells inside a pump station where the floor is below finished grade, the well casing shall extend above the finished floor at least 2 feet.

(d) A tight seal shall be provided around all entry ports into the well. Provisions shall be made to allow the removal of well pump for repair.

(e) All well sources at all public water systems shall be capable of being separately sampled for water quality before entering storage tank(s).

(f) Community public water system wells and those non-transient non-community systems important to public health as specified in Env-Ws 372.17(a) shall have an appropriately sized air tube or alternative provisions for electronic drawdown probes permanently installed in the well which shall allow determination of the static and drawdown water levels by January 1, 2007. Existing wells shall be required to conform with this requirement when well pump repair work is next done.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.24 Appurtenances and Installation of Storage Tanks.

(a) All storage tanks at all public water systems shall have drains. All tanks installed out of doors shall be totally backfilled to minimize damage to tank coating. Storage tanks shall be located above the seasonal high ground water table to prevent possible flotation when empty. Proposals to bury the tank into or below the water table are not acceptable:

(b) Atmospheric storage tanks shall have a down turn "U" vent with fine mesh screening.

(c) All buried steel storage tanks shall be installed in accordance with current industry practice and provided with an adequate passive cathodic protection system, and have protective coating both inside and out. The interior coating shall be certified as being manufactured and applied in accordance with the approved listings in Env-Ws 305. Damage to the exterior coating during construction shall be repaired prior to tank backfill.

(d) For all systems, atmospheric water storage tanks at all community systems and non-transient non-community systems identified in Env-Ws 372.17(a) shall be equipped with a capped filler pipe, which shall be lockable if located on the exterior of the tank, to accommodate tank truck water delivery by January 1, 2007.

(e) All water storage tanks larger than 500 gallons and installed after January 1, 1996 shall have a name plate identifying the following:

(1) Year of manufacture;

(2) Size; and

(3) Pressure rating.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.25 Wiring and Control Devices.

(a) All wiring for water system controls and equipment shall be in accordance with the requirements of rule Elec 404 which cross references the 1996 National Electric Code.

(b) All electrical devices shall be grounded by a separate and dedicated groundwire.

(c) Convenience outlets shall be of the ground fault interrupting type.

(d) All junction boxes, relays, and contactors shall be in enclosures.

(e) Conduits shall be run 2 foot above the floor. Panels shall be mounted at least 3.5 feet above the floor.

(f) All equipment disconnects shall be capable of being locked out during service.

(g) Motorized equipment shall have a functional overload protection above and beyond the protection offered by fuses or circuit breakers. Excluded from this requirement shall be items such as fans, chemical feed pumps, mixers, treatment sequence timers, and dehumidifiers.

(h) All relays and starters not part of an integrated panel shall be labeled.

(i) A detail schematic of the electrical system shall be posted in the enclosure or in an obvious place in the pump station, and shall also be part of the operational manual.

(j) For all systems, the pump controls shall have a manual "off/on/auto" switch to control pump operations where water is pumped into a vented tank or the equivalent. Where the water is pumped into a pressure system, a pressure relief valve or spring loaded "on" switch shall be provided.

(k) Mercury type float switches shall not be in direct contact with drinking water, and shall, if present, be removed and replaced.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.26 Verification of Quality of Distribution Pipe Installation.

(a) Distribution piping shall be installed in accordance with the provisions of C-601, or C-900 of the American Water Works Association as applicable to the type of distribution pipe chosen.

(b) At a new system, the quality of the workmanship and adherence to the approved design and pipe specifications shall be documented in writing to the division in accordance with (c) through (g) below. Such certification shall not be required for the expansion or modification of the distribution system once the initial design has been completed and the EPA ID # has been assigned.

(c) The person who owns and is proposing the creation of the new public water system shall retain the services of a qualified party who is not an employee or otherwise has a financial interest in the project or legal relationship with the project principals to certify the quality of the distribution piping.

(d) The following parties shall be acceptable to the division for providing certification:

(1) A New Hampshire certified water distribution system operator;

(2) A New Hampshire professional engineer;

(3) A city or town building or code enforcement official of the town in which the project is located; or

(4) A civil or environmental designer.

(e) Certification from the developer of the system, or contractor performing the pipe installation, shall not be acceptable.

(f) The person or firm selected by the party proposing the water system to inspect the quality of the piping installation shall provide to the division a map identifying the pipe section observed and a

certificate or letter indicating that the quality of the installation met the AWWA installation standard and was consistent with the best practices in the industry.

(g) The certificate shall include:

(1) Name and address of the developer;

(2) The name of the development and town in which it is located;

(3) Name of the street, and center line stationing for which the certificate applies;

(4) Name of the contractor;

(5) Pipe information including type, size, and cover depth;

(6) The inspector's qualification pursuant to (1) above which indicate expertise with pipe line installation and the AWWA pipe installation specifications; and

(7) Confirmation that the results of the leakage test on the pipe did not exceed the leakage limits specified in the applicable AWWA standards.

(h) The certificate and map as per (f) above shall accompany the "as built" drawings and shall attest to their accuracy.

(i) Such certification shall not be required if the new piping is less than 250 feet.

(j) The requirements of this section shall not apply to new municipally owned water systems.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.27 Distribution System.

(a) The distribution system shall be capable of passing peak flow without excessive frictional loss for all public systems. At peak flow, pressure at the sill elevation of each lot or unit shall be at least 20 psi. This determination shall be made at peak flow and when the atmospheric tank is in a one half empty condition. Consideration shall be given to possible future expansion in the sizing and layout of the proposed community piping system.

(b) Other requirements relative to pressure shall include the following:

(1) Where operational pressure is anticipated to be less than 30 psi, the service line shall be oversized so as to reduce frictional losses. The system owner shall inform each potential service customer of this low pressure before each unit is constructed.

(2) Individual pressurization pumps shall not be used on the service customer's premises to maintain the required 20 psi minimum working pressure.

(3) Maximum system pressure shall be 100 psi. Any portion of the system where pressure is expected to exceed 100 psi shall have pressure reducing valves installed on each individual water service line or on the main line, to maintain pressure at less than 100 psi. A bypass line around a mainline pressure reducer, shall also have a pressure reducer. The water utility shall be responsible for the maintenance of these pressure reducing devices.

(c) For all public systems, piping shall be so valved as to allow isolation of major sections of the distribution network for repairs while still providing service to most of the system. The spacing for on-line gate valves shall not exceed every 1,500 feet. Gate valves shall be provided at all intersecting pipes.

(d) For all public systems, blow-offs shall be required to allow system flushing near the ends of the mains. The size of the "blow-off" shall allow high velocities, at least 2.5 feet per second, to be developed in the distribution piping.

(e) For all public systems where possible, dead-end piping shall be avoided. Near the temporary end of a main, a gate valve shall be installed to allow future piping extension without shutting down the system, or jeopardizing the health of existing consumers.

(f) For all public water systems, water piping shall be bedded in sand or other appropriate material with a minimum cover of not less than 5 feet for year round systems.

(g) If a water main and sewer are to be installed adjacent to one another, minimum horizontal separation of 10 feet shall be maintained.

(h) When conditions prevent this degree of separation the following may be considered by the utility:

(1) Where other utilities or obstacles, not including bedrock, prevent such separation, a waiver may be granted to allow location of the sewer main not less than 3 feet from a water main horizontally, provided that the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer main.

(2) If a water main must cross a sewer main, the water main shall cross above the sewer main, with not less than 18 inches of clear separation.

(3) Water piping may cross under sewer piping only when this is demonstrated to be unavoidable and only when granted by specific waiver. Special construction, including use of ductile iron water and sewer pipe, no pipe joints within 9 feet of the crossing points, and minimum 18 inches clearance shall be required:

(4) Technical criteria supporting a waiver of sewer and water main separation criteria include:

a. The topography of the area; and

b. The number of utility interferences.

(i) For all public systems, piping and valving material and installation techniques shall conform with the most recent revision of the appropriate American Water Works Association (AWWA) specification for that type of piping material where such specification exists. Where such specification does not exist for the size pipe determined by the system design, the minimum pressure rating for piping shall be 200 psi and the piping shall meet the manufacturing requirements of the American Society of Testing and Materials (ASTM) specification 2241.

(j) Other utilities, including but not limited to natural gas, storm drainage, electric, telephone, steam and cable television shall not be installed within three feet of water-mains.

(k) For all public systems, all buried non-metallic piping shall be backfilled with an effective metal tracing element located above the pipe approximately 6 inches below the finished grade.

(l) On-line gate valves and house service shut-offs shall be equipped with cast iron gate box extensions. Gate valve boxes shall have cast iron covers clearly marked by the word "water" or other appropriate water supply marking and shall be installed flush with the finished grade.

(m) Rigid connections shall not be used to construct or repair distribution piping systems.

Source. (See Revision Note at chapter heading Env-Ws 300) #6521, eff 6-4-97

Env-Ws 372.28 System Construction.

(a) For all water systems, once all other state and local approvals have been obtained and upon design approval, the system can be installed. If a portion of the facility is to be installed at a later date, phased with the actual growth of the development, this shall be indicated at the time of original submittal.

(b) For all systems, detailed measurements shall be made of the exact location of all buried piping including service connections, gate valves, and blow-offs.

(c) As built record drawings of the distribution system shall conform to the following conditions:

(1) Precisely measured dimensions to all on-line gate valves;

(2) Precisely measured dimensions to all blow-offs;

(3) Precisely measured dimensions to all house service shut-offs;

(4) Precisely measured dimensions to all house service taps to primary mains;

(5) Precisely measured dimensions to all distribution piping at approximately 200 foot intervals;

(6) Precisely measured dimensions to any principal changes in pipe direction or size; and

(7) Precisely measured shall mean of sufficient accuracy to locate the facility or appurtenance to within 1 foot accuracy and shall be given to the nearest 0.5 foot.

(d) For community systems, a "as built record drawing" copy of the distribution plan with these dimensions noted shall be filed with the division and a second copy with the entity that operates or will operate the water system.

(e) For community systems, in accordance with RSA 485.24, the division, or its authorized designee, such as a local town engineer or health officer shall have the authority requiring a limited number of exploratory pipeline excavations to verify the accuracy of the record drawings and to verify the nature of the pipe installation, including bedding and cover.

(f) For all systems, flushing and chlorination of the system shall be required before use. Before the final certified inspection, the entire system, distribution pipes, storage tanks and pumps shall be flushed to remove any dirt or other contaminants, and then chlorinated at a concentration of 50 parts per million in accordance with AWWA specification C 651. After 24 hours, the system shall then be flushed again to remove all traces of chlorine and a water sample shall be taken from the end of the distribution system and analyzed for bacterial quality at the laboratory services unit of DES in Concord, or other certified laboratory.

(g) For community systems, leakage test of the piping system shall be required before system use. The distribution system shall be checked for leakage by conducting a sustained pressure test for at least 2

hours, in accordance with AWWA specification C 600. Leakage shall not exceed the value given in C 600.

Source. (See Revision Note at chapter heading for Env-Ws 300) #6521, eff 6-4-97; amd by #7105, eff 9-23-99

Env-Ws 372.29 Final Certified Inspection.

(a) For all systems, upon completion of the installation of a new public water system, but before any service is offered, the system shall be given a final certified inspection by division personnel. This inspection shall be performed within 5 working days after notification by the owner of the system. The system shall not be approved for any service unless this inspection is completed.

(b) The proposed operator shall have taken or arranged to take the operator certification exam as required under Env-Ws 367 and shall be in attendance at this inspection.

Source. (See Revision Note at chapter heading for Env-Ws 300) #6521, eff 6-4-97